AIO3382U/3384U
Analog I/O and
Digital I/O Card

User's Manual (V1.0)

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Correction record

Version	Record

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Notes on hardware installation

Please follow step by step as you are installing the control cards.

1. Be sure your system is power off.
2. Be sure your external power supply for the wiring board is power off.
3. Plug your control card in slot, and make sure the golden fingers are put in right contacts.
4. Fasten the screw to fix the card.
5. Connect the cable between the card and wiring board.
6. Connect the external power supply for the wiring board.
7. Recheck everything is OK before system power on.
8. External power on.

Congratulation! You have it.

For more detail of step by step installation guide, please refer the file “installation.pdf “ on the CD come with the product or register as a member of our user’s club at:

http://automation.com.tw/

to download the complementary documents.

1. Forward

Thank you for your selection of our PCI bus AIO338XU an analog I/O, digital I/O and multi-function timer/counter card.

The 16bit analog input range of AIO338XU series, covers –10V~+10V, -5V~+5V, 0~10V, 0~5V (software configurable), 0~20mA, 4~20mA (hardware selectable). The 16bit analog output ranges from –10V to +10V and 0~20mA, 4~20mA current source or sink is hardware option. The extra 2 32bit timer/counter ports also provide you versatile functions such as: programmable one-shot, rate generator, square wave generator, software/hardware triggered strobe, event timer/counter, triggered timer/counter, PWM generator, …. A small card with abundant functions.

We divide into 7 types for your convenience:

AIO3382U Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card

AIO3382UA Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current source AO)

AIO3382UB Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current sink AO)

AIO3384U Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card

AIO3384UAA Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi- function timer/counter card (4 current source AO)

AIO3384UAB Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (2 current source AO , 2 current sink AO)

AIO3384UBB Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (4 current sink AO)

Wish you would enjoy this card!

Other analog I/O card:

AIO3310/1/2A 8/16/24 single/differential 16bit analog input, 16 TTL i/o card (PCI bus)

AIO3315/A 12/16 bit Analog I/O and Digital I/O Card (PCI bus)

AIO3320/3321 isolated 8 12 bit A/D, isolated 8/16 16 bit D/A with isolated 8DI,8DO(PCI bus)

AIO3322/3323 Isolated Analog I/O Card, 12bit AI x8 with triggered data acquisition, 16 bit AO x 8/16 and isolated 8DI,8DO and 2 32bit multi function timer/counter (include bracket kit for digital I/O and AO) (PCI bus)

AIO6328/A 12/16 bit Analog I/O and Digital I/O PCI-104 Module

Any comment is welcome,
please visit our website
http://www.automation.com.tw/
http://www.automation-js.com/ for the up to date information.

2. Features

2.1 Main card

General:

2.1.1 PCI plug and play function with card ID for 16 identical cards

2.1.2 Security password blocks illegal copy of software

Analog input function:

2.1.3 8-channel 16bit analog inputs (differential or single end)

2.1.4 Input range: -10V~ +10V, -5V~ +5V, 0~10V, 0~5V, 0~20mA, 4~20mA

Analog output function:

2.1.5 2/4-channel 16bit analog output

2.1.6 Output range: -10V~ +10V, 0~20mA, 4~20mA source/sink

Digital I/O function:

2.1.7 16 TTL I/O

Timer/Counter function:

2.1.8 2 32bit multifunction timer/ counter.

2.1.9 multi-function:

-- programmable one-shot

-- square wave generator

-- event counter

-- PWM generator

-- Quadrature counter

2.1.10 2 trigger/counter in, 2 trigger out of timer/counter function

2.2 Din rail mounted wiring board

2.2.1 37 pin D-type connector to wiring terminals for AI0~AI7, DA0~DA3

2.2.2 25 pin D-type connector to wiring terminals for TTL I/O

3. Specifications

3.1 Main card

General:

3.1.1 PCI data width — 32 Bits

3.1.2 Card ID — 0-15 selectable.

3.1.3 Security password — 10 bytes, user configurable

3.1.4 Interrupt — software disable/enable

3.1.5 Dimension — 167(W)*115(H)mm , 6.6(W) * 4.6(H)in

Analog input block:

3.1.6 input channels — 8 channel single end or differential.

3.1.7 resolution — 16bit

3.1.8 input range — -10V~ +10V, -5V~ +5V , 0~10V, 0~5V (software selectable)
0~20mA, 4~20mA (hardware selectable)

3.1.9 conversion speed — 5us per channel

Analog output block:

3.1.10 output channels — 2/4 channel

3.1.11 resolution — 16bit

3.1.12 output range — -10V~ +10V
0~20mA, 4~20mA source or sink (option)

Digital I/O block:

3.1.13 I/O channels — 2 byte configurable TTL

Timer/Counter block:

3.1.14 channels — 2

3.1.15 data length — 32 bit

3.1.16 specific input — trigger in/ counter in via digital port0

3.1.17 specific output — trigger out / counter out via digital port1

3.1.18 time base — 1MHz(timer), 33MHz (counter)

3.1.19 functions —

-- programmable one-shot

-- square wave generator

-- event counter

-- PWM generator

3.2 Din rail mounted wiring board

JS51026 For AI0~AI7 and DA0~DA3

3.2.1 Connection cable — D-type 37P cable to connect main and wiring board

3.2.2 Dimension — 90(W)*113(L)*60(H)mm , 3.6(W)*4.5(L)*2.4(H)in

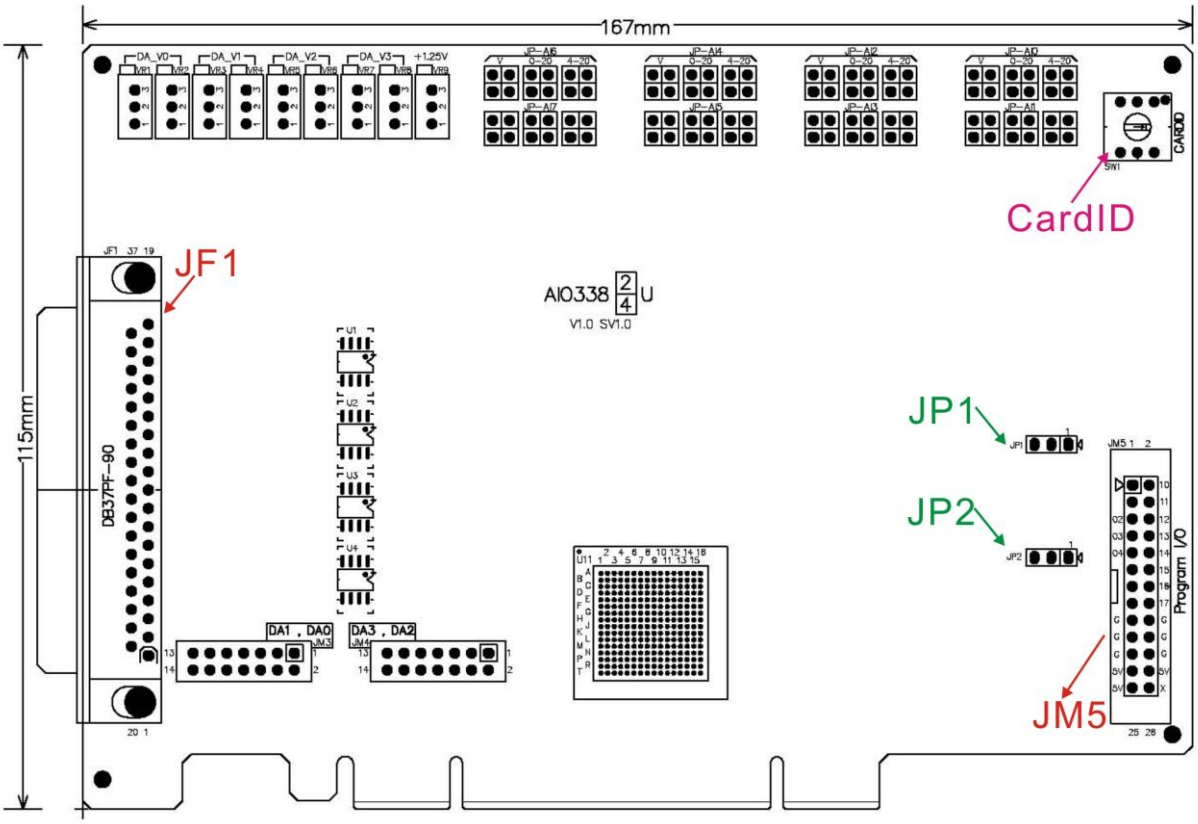
JS51050 For TTL I/O

3.2.3 Connection cable — D-type 25P cable to connect main and wiring board

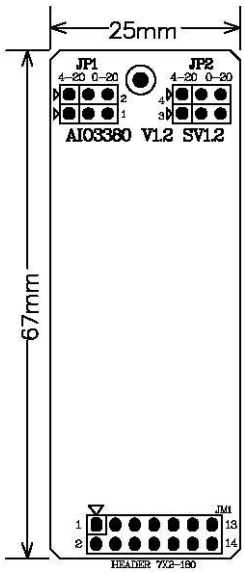
3.2.4 Dimension — 86(W)*79(L)*52(H)mm , 3.4(W)*3.2(L)*2.1(H)in

4. Layout and dimensions

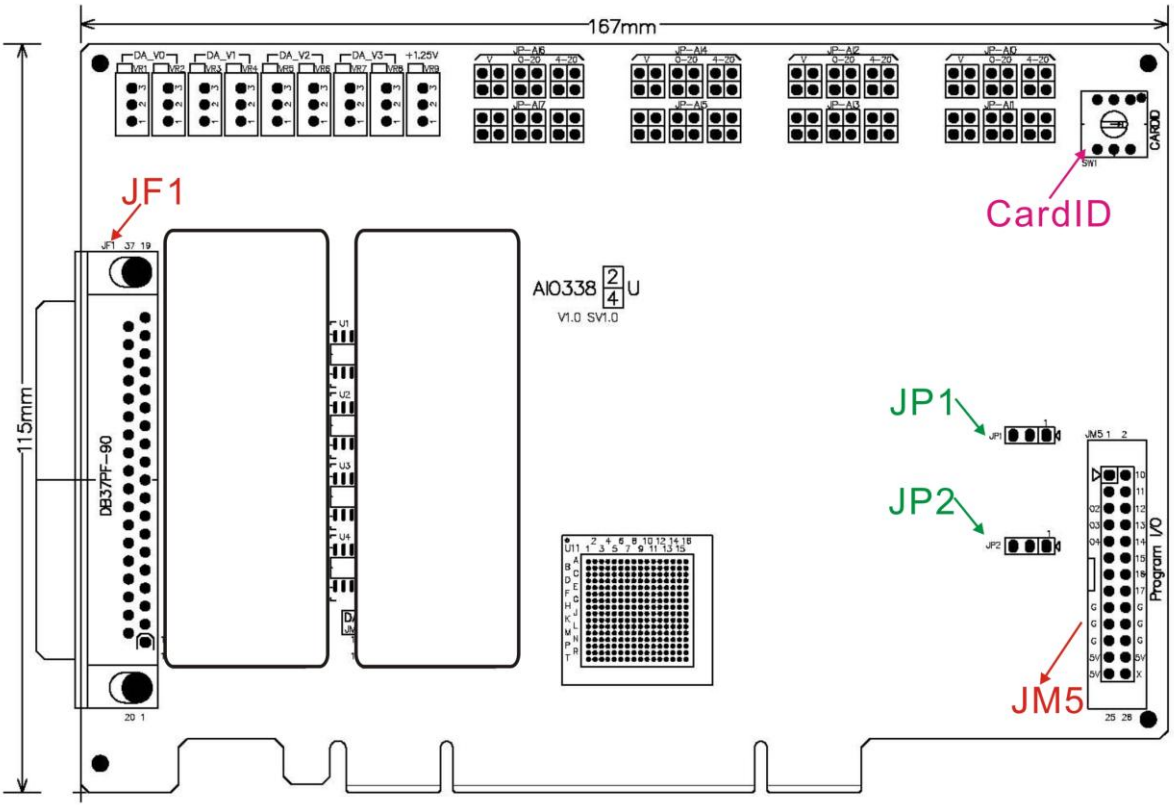
4.1 AIO338XU Main card



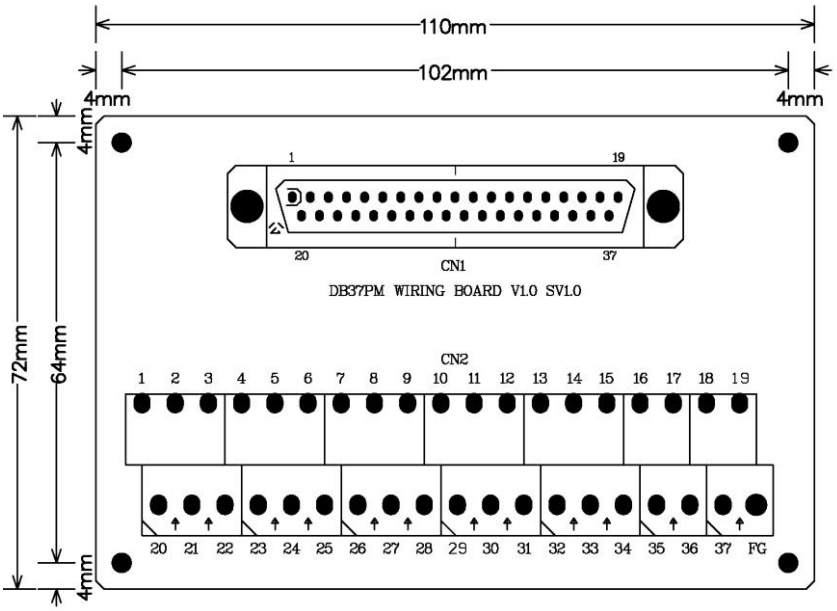
4.2 AIO338XU daughter card



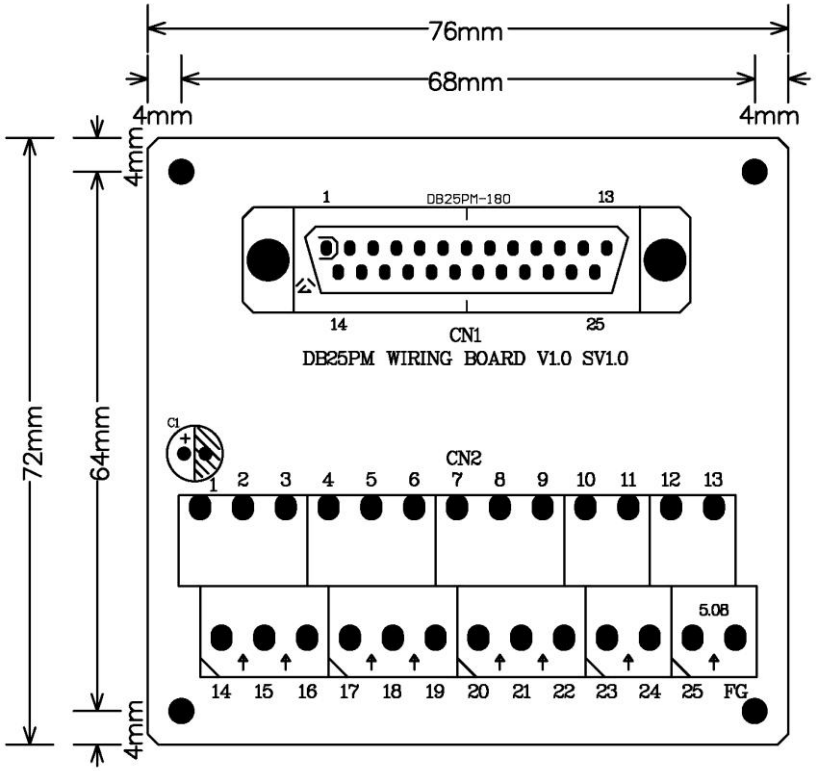
4.3 AIO338XU piggy back



4.4 JS51026 37P Din rail mounted dummy wiring board



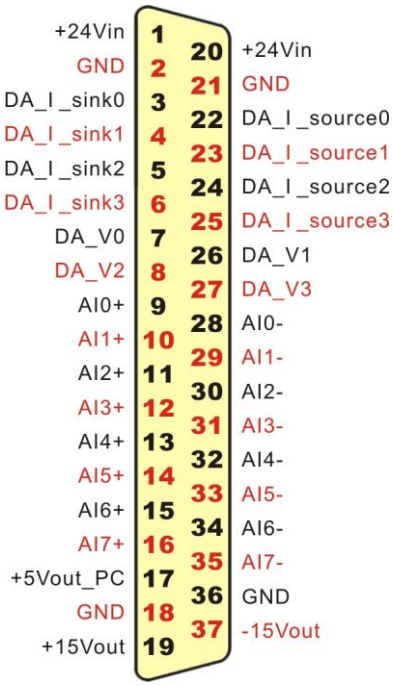
4.5 JS51050 25P Din rail mounted dummy wiring board



5. Pin definitions

5.1 Pin definitions for JF1 (on card 37P) connector

PIN	DESCRIPTIONS
1	24Ve: external 24V input *
2	GND: ground
3	DA_I_sink0: DA0 current sink output
4	DA_I_sink1: DA1 current sink output
5	DA_I_sink2: DA2 current sink output
6	DA_I_sink3: DA3 current sink output
7	DA_V0: DA0 output
8	DA_V2: DA2 output
9	AI0+: AD0 + input
10	AI1+: AD1 + input
11	AI2+: AD2 + input
12	AI3+: AD3 + input
13	AI4+: AD4 + input
14	AI5+: AD5 + input
15	AI6+: AD6 + input
16	AI7+: AD7 + input
17	+5V_PC: PC 5V out
18	GND: ground
19	+15Ve:+15V output *



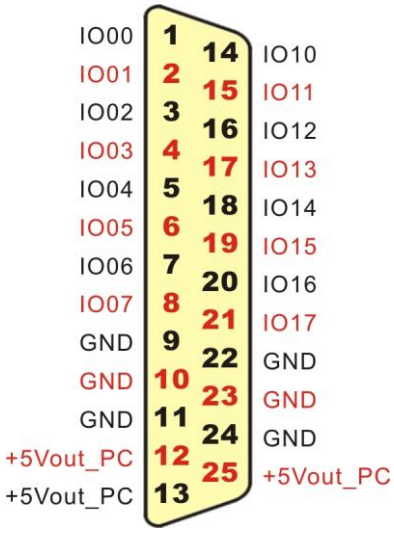
PIN	DESCRIPTIONS
20	24Ve: external 24V input *
21	GND: ground
22	DA_I_source0: DA0 current source output
23	DA_I_source1: DA1 current source output
24	DA_I_source2: DA2 current source output
25	DA_I_source3: DA3 current source output
26	DA_V1: DA1 output
27	DA_V3: DA3 output
28	AI0-: AD0 - input
29	AI1-: AD1 - input
30	AI2-: AD2 - input
31	AI3-: AD3 - input
32	AI4-: AD4 - input
33	AI5-: AD5 - input
34	AI6-: AD6 - input
35	AI7-: AD7 - input
36	GND: ground
37	-15Ve:-15V output *

***NOTE:**

1. +15Ve, -15Ve are on card DC/DC converter output, it is for reference purpose only not suit for working as power supply. Any load from them should be less than 5mA.
2. The external 24V input only required at current mode (sink/source) application.

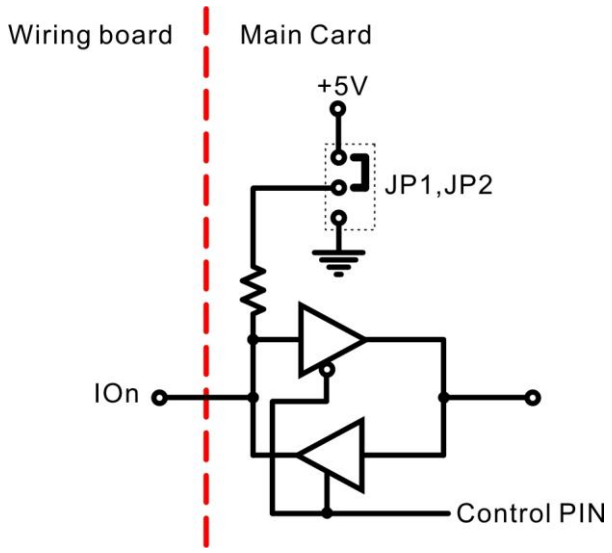
5.2 Pin definitions for JM5 (extension 25P) connector

PIN	DESCRIPTIONS		PIN	DESCRIPTIONS
1	IO00: TTL port0 bit0		14	IO10: TTL port1 bit0
2	IO01: TTL port0 bit1		15	IO11: TTL port1 bit1
3	IO02: TTL port0 bit2		16	IO12: TTL port1 bit2
4	IO03: TTL port0 bit3		17	IO13: TTL port1 bit3
5	IO04: TTL port0 bit4		18	IO14: TTL port1 bit4
6	IO05: TTL port0 bit5		19	IO15: TTL port1 bit5
7	IO06: TTL port0 bit6		20	IO16: TTL port1 bit6
8	IO07: TTL port0 bit7		21	IO17: TTL port1 bit7
9	GND: ground		22	GND: ground
10	GND: ground		23	GND: ground
11	GND: ground		24	GND: ground
12	+5V_PC: PC 5V out		25	+5V_PC: PC 5V out
13	+5V_PC: PC 5V out			



6. I/O interface diagram

6.1 Digital I/O diagram

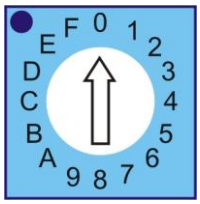


For byte-programmable TTL I/O IO00 ~ IO07, IO10 ~ IO17 to configured as pull high or pull low. JP1,JP2 are used for output state of power on. (refer 7.2 JP1,JP2 Jumper setting)

7. Hardware descriptions

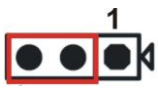
7.1 Card ID setting

Since PCI cards have plug and play function, the card ID is required for programmer to identify which card he/she will control without knowing the physical address assigned by the Windows (OS). There is a 16 position rotary switch for extinguishing the 16 identical cards. Please set the card ID as you need and note that no two cards (of the same type) are in the same ID.



7.2 JP1,JP2 Jumper setting

The TTL I/O can be configured as pull high or pull low by jumper setting.

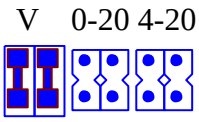
	
1-2 short Pull High	2-3 short Pull Low

7.3 Timer/Counter

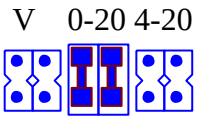
There are 2 timer/counters on board. Each one has 32 bit register length, if you program as PWM mode, the register is divided as 2 16 bit width, the upper 16 bit work as the pulse high width and the lower 16 bit work as PWM frequency register. The card also provide end of count interrupt function of both the timer/counters.

7.4 Analog input

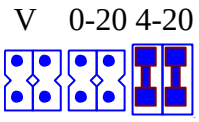
There are 8 channels of analog input on card, the hardware may accept 0~5V, 0~10V, -5V~ +5V, -10V ~ +10V range according you software configuration. If you want to use current input mode, configure the jumpers each channel.



Voltage input mode



0~20mA current input mode

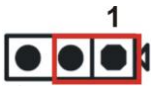
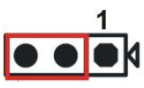


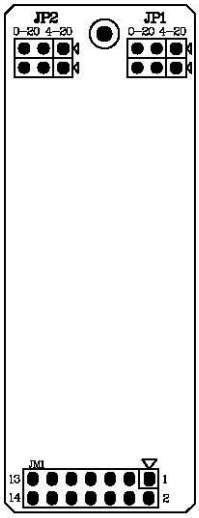
4~20mA current input mode

Since the voltage/current analog input has AI+ and AI- input, for voltage single end mode, please connect AI- to ground (analog input reference).

7.5 Analog output

There are 2/4 channels of analog output on card, the output of DA is 16 bit width and -10V ~+10V range only. If you want to use current output mode, the hardware option card should be selected and the wiring change from DA_Vn (for voltage output mode) to DA_I_sinkn (for current sink mode) or DA_I_sourcen(for current source mode) respectively.

	
1-2 short 4~20mA	2-3 short 0~20mA



8. Applications

8.1 Analog input section:

For measurement of analog signal such as:

- temperature
- voltage
- current
- flow
- light
- ....

Note: The analog signal should be pre-processed to the acceptable range of the card.

8.2 Analog output section:

For control or signal generation such as:

- inverter speed
- servo motor speed
- wave generation
- valve control
- light control
- ....

8.3 Digital section:

For the control of digital i/o:

- switch input
- relay control
- trigger output
- ...

8.4 Counter/Timer section:

- event counting
- periodic interrupt source
- PWM generator (can work as D/A with external low pass filter)
- counter/timer with trigger out
- duration counter
- quadrature counter for encoder or linear scale

9. Wiring reference

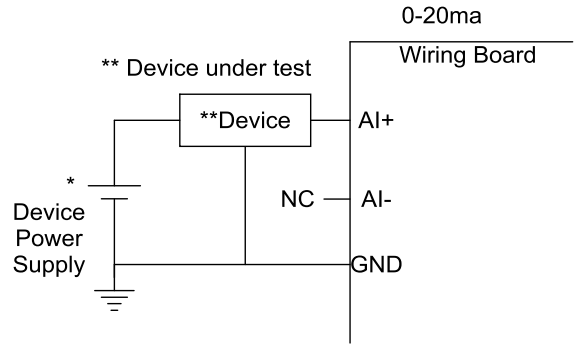


fig 9.1 connection while card setting 0~20mA analog input

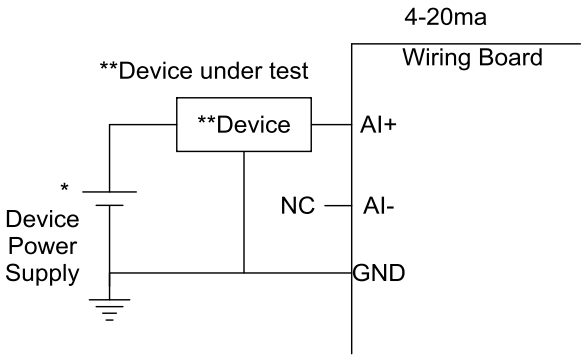


fig 9.2 connection while card setting 4~20mA analog input

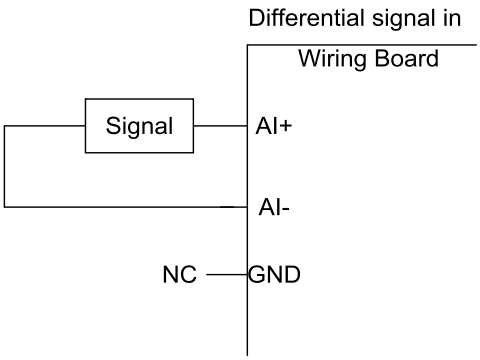


fig 9.3 connection while card setting voltage input

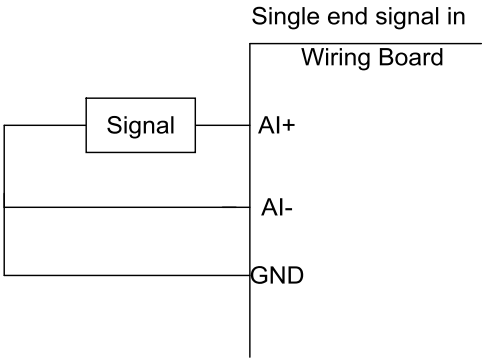


fig 9.4 connection while card setting voltage input

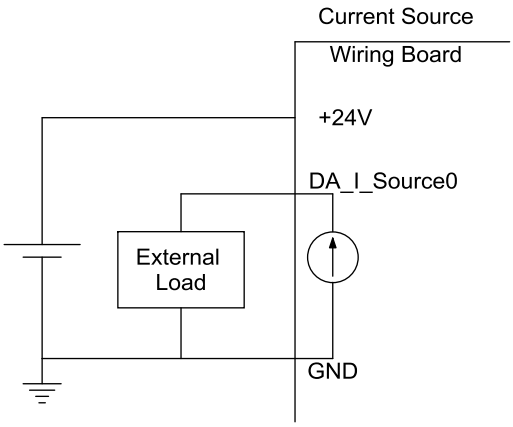


fig 9.5 connection while current source output option (A option)

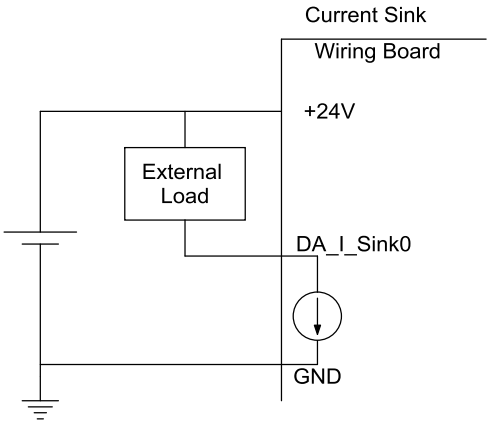


fig 9.6 connection while current sink output option (B option)

10. Ordering information

PRODUCT	DESCRIPTIONS
AIO3382U	Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (include bracket kit for TTL I/O)
AIO3382UA	Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current source AO) (include bracket kit for TTL I/O)
AIO3382UB	Analog I/O Card, 8 AI 2 AO, 16 TTL , 2 multi- function timer/counter card (2 current sink AO) (include bracket kit for TTL I/O)
AIO3384U	Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (include bracket kit for TTL I/O)
AIO3384UAA	Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi- function timer/counter card (4 current source AO) (include bracket kit for TTL I/O)
AIO3384UAB	Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (2 current source AO , 2 current sink AO) (include bracket kit for TTL I/O)
AIO3384UBB	Analog I/O Card, 8 AI 4 AO, 16 TTL , 2 multi-function timer/counter card (4 current sink AO) (include bracket kit for TTL I/O)
JS51026	Dummy DIN rail mounted wiring board (D-type 37P to terminals)
JS51050	Dummy DIN rail mounted wiring board (D-type 25P to terminals)
M270337X0	D type 37p male-female cable 1.5M
M270337X0S	D type 37p male-female cable 1.5M, shielding
M270337X2	D type 37p male-female cable 3.0M
M270337X2S	D type 37p male-female cable 3.0M, shielding
M270325X4	D type 25p male-female cable 1.5M
M270325X4S	D type 25p male-female cable 1.5M, shielding
M270325X0	D type 25p male-female cable 3.0M
M270325X0S	D type 25p male-female cable 3.0M, shielding
SM23404	Extension kit for JM5 (bracket for 25p D-type connector , 26p flat cable)